

Parallel grippers HGP, with protective dust cap



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Key features

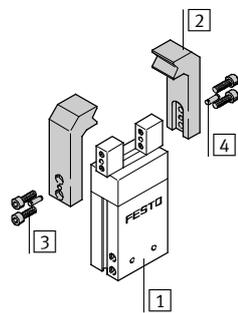
At a glance

- Double-acting piston drive
- With protective dust cap for use in dusty environments (protection class IP54)
- Self-centring
- Variable gripping action:
 - External/internal gripping
- High gripping force and compact size
- Max. repetition accuracy
- Internal fixed flow control
- Versatility thanks to externally adaptable gripper fingers
- Wide range of options for mounting on drive units
- Sensor technology:
 - Adaptable proximity sensors for the small grippers
 - Integratable proximity sensors for the medium and large gripper sizes

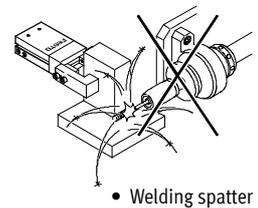
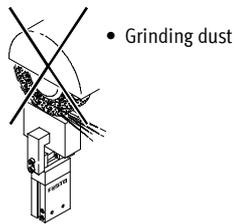
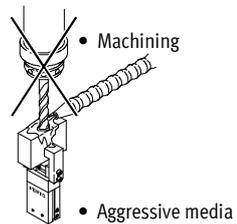
-  - Note
 Gripper selection sizing software
 → www.festo.com

Mounting options for external gripper fingers (customer-specific)

- 1 Parallel gripper
- 2 External gripper finger
- 3 Mounting screws
- 4 Centring pins



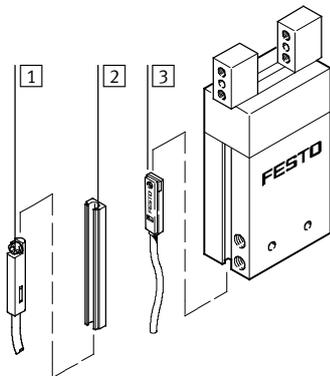
-  - Note
 These grippers should always be used with exhaust air flow control. They are not suitable for the following or similar applications:



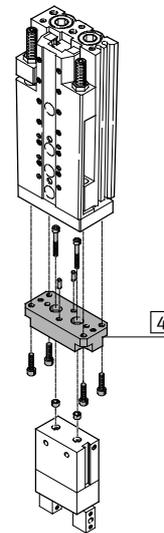
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Peripherals overview and type codes

Peripherals overview



System product for handling and assembly technology



Accessories			
Type	Brief description		→ Page/Internet
1	Proximity sensor SME/SMT-10	For sensing the piston position	10
2	Bondable sensor rail HGP-SL	Enables the use of proximity sensors SME/SMT-10	9
3	Proximity sensor SME/SMT-8	For sensing the piston position	9
4	-	Drive/gripper connections	adapter kit

Type codes

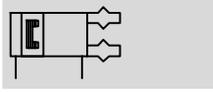
HGP		-	16	-	A	-	B	-	SSK
Type									
HGP	Parallel gripper								
Size									
Position sensing									
A	Via proximity sensor								
Generation									
B	B series								
Protective dust cap									
SSK	Protective dust cap								

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Technical data

Function
Double-acting



Size
16, 25 mm

Stroke
10, 14 mm

General technical data			
Size	16		25
Design	Lever		
Mode of operation	Double-acting		
Gripper function	Parallel		
Number of gripper jaws	2		
Max. load per external gripper finger ¹⁾	[g]	40	80
Stroke per gripper jaw	[mm]	5	7.5
Pneumatic connection	M3		G1/8
Repetition accuracy ²⁾	[mm]	≤ 0.04	
Max. interchangeability	[mm]	0.2	
Max. operating frequency	[Hz]	4	
Position sensing	Via proximity sensor		
Type of mounting	Via female thread and centring sleeve		
	Via through-hole and centring sleeve		
Mounting position	Any		
Product weight	[g]	197	737

1) Valid for unthrottled operation

2) End-position drift under constant conditions of use with 100 consecutive strokes in the direction of movement of the gripper jaws

• Note: This product conforms to ISO 1179-1 and to ISO 228-1

Operating and environmental conditions			
Min. operating pressure	[bar]	2	
Max. operating pressure	[bar]	8	
Operating medium	Compressed air in accordance with ISO 8573-1:2010 [7:4:4]		
Note on operating/pilot medium	Operation with lubricated medium possible (in which case lubricated operation will always be required)		
Ambient temperature	[°C]	+5 ... +60	
Corrosion resistance class CRC ¹⁾		1	

1) Corrosion resistance class 1 according to Festo standard 940 070

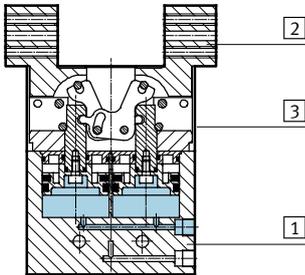
Components subject to low corrosion stress. Transport and storage protection. Parts that do not have primarily decorative surface requirements, e.g. in internal areas that are not visible or behind covers.

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Technical data

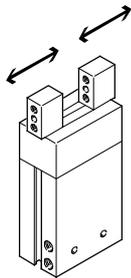
Materials

Sectional view



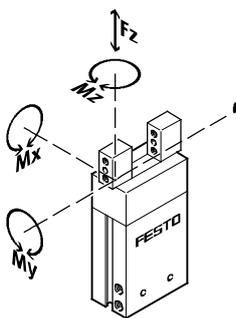
Parallel gripper		
1	Housing	Hard anodised aluminium
2	Gripper jaw	High-alloy steel
3	Cover cap	Polyamide
-	Protective dust cap	Vulcanised thermoplastic
-	Note on materials	Free of copper and PTFE RoHS-compliant

Gripping force [N] at 6 bar



Size	16	25
Gripping force per gripper jaw		
Opening	70	185
Closing	80	170
Total gripping force		
Opening	140	370
Closing	160	340

Characteristic load values per gripper jaw



The indicated permissible forces and torques apply to a single gripper jaw. The indicated values include the lever arm, additional applied loads caused

by the workpiece or external gripper fingers, as well as forces which occur during movement.

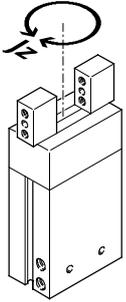
The zero coordinate line (gripper jaw guide) must be taken into consideration for the calculation of torques.

Size	16	25	
Max. permissible force F_z	[N]	90	240
Max. permissible torque M_x	[Nm]	3.3	11
Max. permissible torque M_y	[Nm]	3.3	11
Max. permissible torque M_z	[Nm]	3.3	11

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Technical data

Mass moment of inertia [$\text{kgm}^2 \times 10^{-4}$]



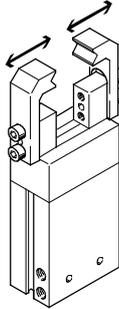
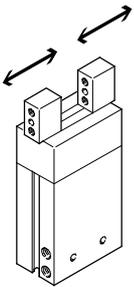
Mass moment of inertia [$\text{kgm}^2 \times 10^{-4}$] for parallel grippers in relation to the central axis, without external gripper fingers, without load.

Size	16	25
HGP-...	0.47	3.83

Opening and closing times [ms] at 6 bar

Without external gripper fingers

With external gripper fingers



The indicated opening and closing times [ms] have been measured at room temperature and 6 bar operating pressure without external gripper fingers.

The grippers must be throttled for greater loads [g]. Opening and closing times must then be adjusted accordingly.

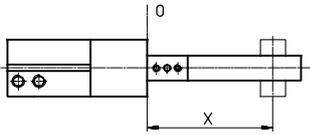
Size	16		25
Without external gripper fingers			
HGP-...	Opening	44	47
	Closing	60	50
With external gripper fingers (as a function of the load)			
HGP-...	100 g	100	-
	150 g	200	100
	200 g	300	200
	300 g	-	300

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Technical data

Gripping force F_H per gripper jaw as a function of operating pressure and lever arm x

External and internal gripping (closing and opening)

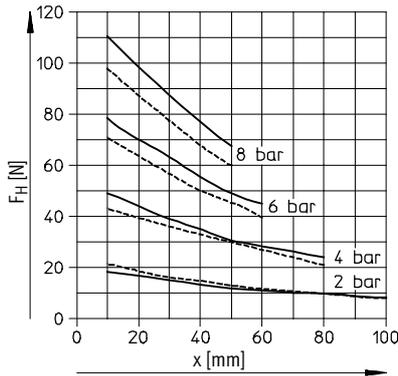


Gripping forces as a function of operating pressure and lever arm (distance from the zero co-ordinate line shown

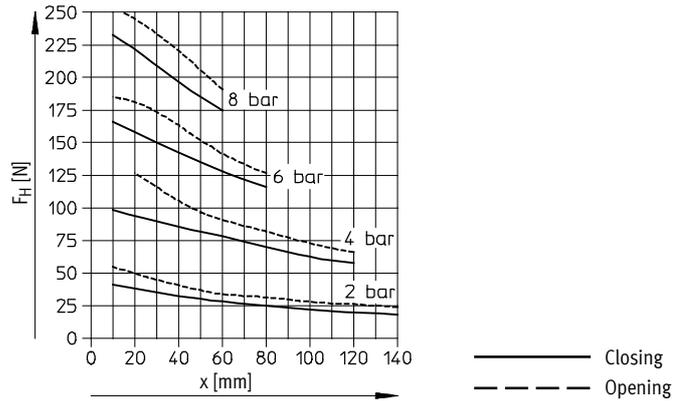
opposite to the pressure point at which the fingers grip the workpiece)

can be determined for the various sizes from the following graphs.

HGP-16-...

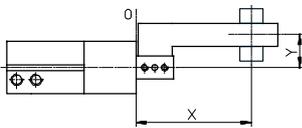


HGP-25-...



Gripping force F_H per gripper jaw at 6 bar as a function of lever arm x and eccentricity y

External and internal gripping (closing and opening)



Gripping forces at 6 bar as a function of eccentric application of force (distance from the zero co-ordinate line

shown opposite to the pressure point at which the fingers grip the workpiece) and the maximum permissible

off-centre point at which force is applied can be determined for the various sizes from the following graphs.

Calculation example

Given:

HGP-16-A-B-SSK

Lever arm $x = 20$ mm

Eccentricity $y = 22$ mm

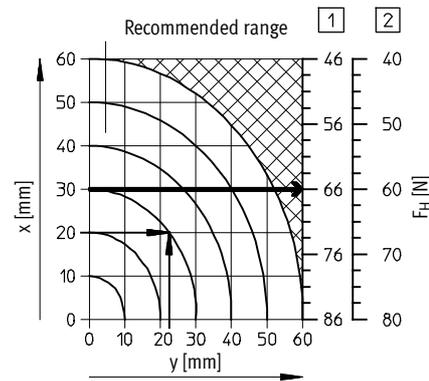
To be calculated:

Gripping force at 6 bar

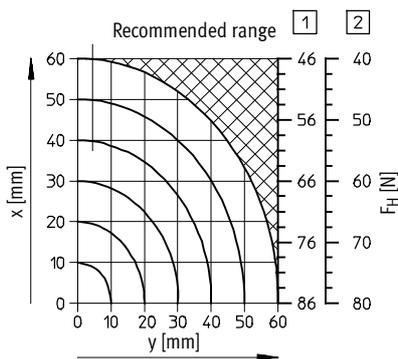
Procedure:

- Determine the intersection xy between lever arm x and eccentricity y in the graph for HGP-16-...

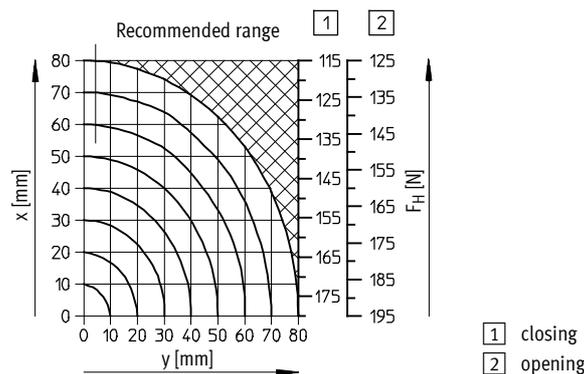
- Draw an arc (with centre at origin) through intersection xy
 - Determine the intersection between the arc and X-axis
 - Read the gripping force
- Result:
Gripping force = approx. 66 N



HGP-16-...



HGP-25-...



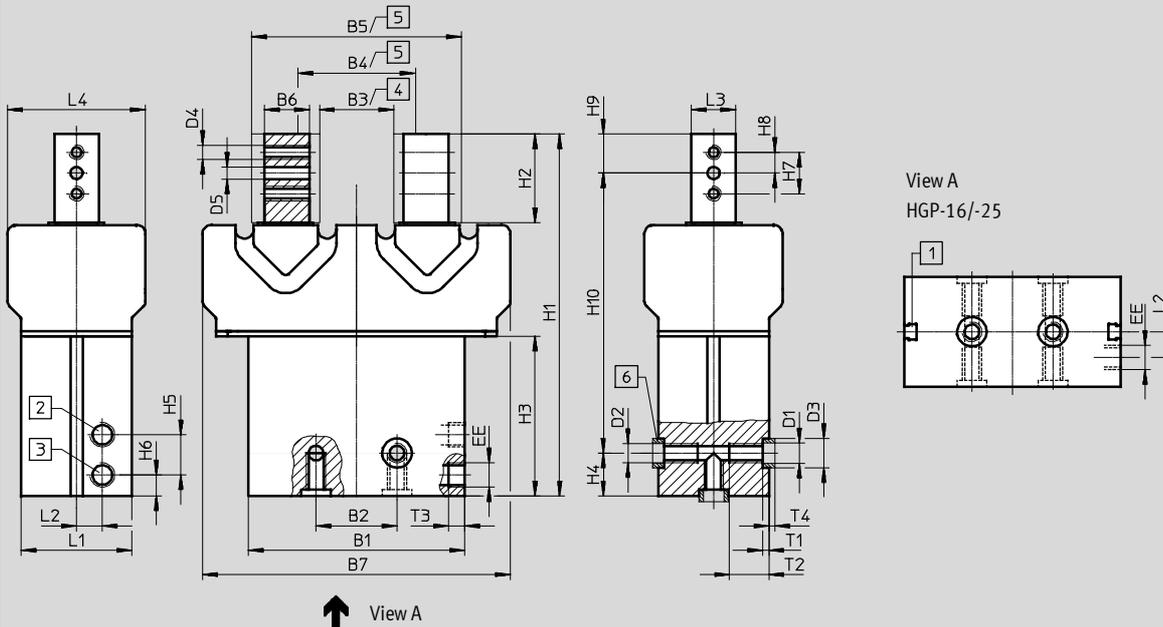
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Technical data

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Dimensions

Download CAD data → www.festo.com



1 Slot for proximity sensor
SME/SMT-8
Proximity sensors SME-/SMT-10
can also be used in combination
with the bondable sensor rail.

2 Supply port, opening
3 Supply port, closing
4 Closed
5 Open
6 Centring sleeves ZBH
(2 included in the scope of
delivery)

The distance H5 = 7 mm between
the two air connections on types
HGP-16 means that only the
following fittings can be used:

- QSM-M3-3
- QSML-M3-3
- QSMLL-M3-3
- CN-M3-PK-3
- LCN-M3-PK-3

Size	B1	B2 ¹⁾	B3	B4	B5	B6	B7	D1	D2	D3	D4	D5	EE	H1	H2	H3
[mm]		±0.1	±0.5	±0.5	±0.5	-0.03	±0.5	∅		∅		∅				
16	47	25	16.4	26.4	46.4	10	67	5.3	M4	7	M4	3	M3	83	20.5	38.1
25	68.2	29	21	36	66	15	101	6.4	M6	9	M5	4	G ¹ / ₈	126.8	31.5	58.8

Size	H4 ²⁾	H5	H6	H7	H8	H9	H10	L1	L2	L3	L4	T1	T2	T3	T4
[mm]	±0.1						±0.2			-0.03		+0.1	+1	+0.5	-0.3
16	7.5	7	4	11	5.5	10	65.5	22	5.7	10	30	1.6	7.5	3.5	1.4
25	17.5	16.5	8.3	16	8	15	94.3	37	10.5	15	47	2.1	15	6.5	1.9

1) Tolerance for centring hole: ±0.02

2) Tolerance for centring hole: -0.05

- Note: This product conforms to ISO 1179-1 and to ISO 228-1

Ordering data

Size	Part No.	Type
16	539636	HGP-16-A-B-SSK
25	539635	HGP-25-A-B-SSK

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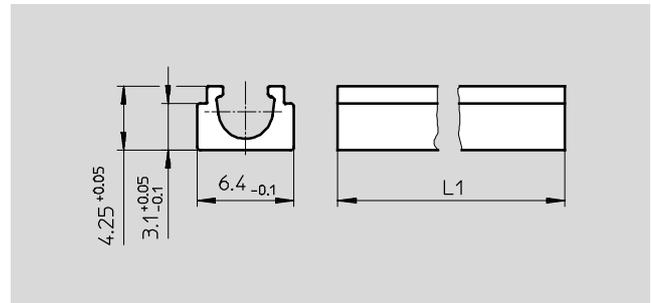
Accessories

Sensor rail HGP-SL

bondable

Material:

Wrought aluminium alloy



Dimensions and ordering data					
For size [mm]	L1	Weight [g]	Part No.	Type	
16	38	1.5	535583	HGP-SL-10-16	
25	58	2.3	535585	HGP-SL-10-25	

Ordering data						
Type	For size	Weight [g]	Part No.	Type	PU ¹⁾	
Centring sleeve ZBH			Technical data → Internet: zbh			
	16	1	186717	ZBH-7	10	
	25		150927	ZBH-9		

1) Packaging unit

Ordering data – Proximity sensors for T-slot, magneto-resistive						Technical data → Internet: smt
	Type of mounting	Switch output	Electrical connection	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above, flush with cylinder profile, short design	PNP	Cable, 3-wire	2.5	574335	SMT-8M-A-PS-24V-E-2,5-OE
			Plug M8x1, 3-pin	0.3	574334	SMT-8M-A-PS-24V-E-0,3-M8D
		NPN	Cable, 3-wire	2.5	574338	SMT-8M-A-NS-24V-E-2,5-OE
			Plug M8x1, 3-pin	0.3	574339	SMT-8M-A-NS-24V-E-0,3-M8D
N/C contact						
	Insertable in the slot from above, flush with cylinder profile, short design	PNP	Cable, 3-wire	7.5	574340	SMT-8M-A-PO-24V-E-7,5-OE

Ordering data – Proximity sensors for T-slot, magnetic reed						Technical data → Internet: sm	
	Type of mounting	Switching output	Electrical connection	Cable length [m]	Part No.	Type	
N/O contact							
	Insertable in the slot from above, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	543862	SME-8M-DS-24V-K-2,5-OE	
				5.0	543863	SME-8M-DS-24V-K-5,0-OE	
			Plug M8x1, 3-pin	Cable, 2-wire	2.5	543872	SME-8M-ZS-24V-K-2,5-OE
				0.3	543861	SME-8M-DS-24V-K-0,3-M8D	
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	2.5	150855	SME-8-K-LED-24	
			Plug M8x1, 3-pin	0.3	150857	SME-8-S-LED-24	
N/C contact							
	Insertable in the slot lengthwise, flush with the cylinder profile	Contacting	Cable, 3-wire	7.5	160251	SME-8-O-K-LED-24	

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Accessories

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Ordering data – Proximity sensors for C-slot, magneto-resistive						Technical data → Internet: sm
	Type of mounting	Switching output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above	PNP	Cable, 3-wire, in-line	2.5	551373	SMT-10M-PS-24V-E-2,5-L-OE
			Plug M8x1, 3-pin, in-line	0.3	551375	SMT-10M-PS-24V-E-0,3-L-M8D
			Plug M8x1, 3-pin, lateral	0.3	551376	SMT-10M-PS-24V-E-0,3-Q-M8D

Ordering data – Proximity sensors for C-slot, magnetic reed						Technical data → Internet: sm
	Type of mounting	Switching output	Electrical connection, connection direction	Cable length [m]	Part No.	Type
N/O contact						
	Insertable in the slot from above	Contacting	Plug M8x1, 3-pin, in-line	0.3	551367	SME-10M-DS-24V-E-0,3-L-M8D
			Cable, 3-wire, in-line	2.5	551365	SME-10M-DS-24V-E-2,5-L-OE
			Cable, 2-wire, in-line	2.5	551369	SME-10M-ZS-24V-E-2,5L-OE
	Insertable in the slot lengthwise	Contacting	Plug M8x1, 3-pin, in-line	0.3	173212	SME-10-SL-LED-24
			Cable, 3-wire, in-line	2.5	173210	SME-10-KL-LED-24

Ordering data – Connecting cables					Technical data → Internet: nebu
	Electrical connection, left	Electrical connection, right	Cable length [m]	Part No.	Type
	Straight socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541333	NEBU-M8G3-K-2.5-LE3
			5	541334	NEBU-M8G3-K-5-LE3
	Straight socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541363	NEBU-M12G5-K-2.5-LE3
			5	541364	NEBU-M12G5-K-5-LE3
	Angled socket, M8x1, 3-pin	Cable, open end, 3-wire	2.5	541338	NEBU-M8W3-K-2.5-LE3
			5	541341	NEBU-M8W3-K-5-LE3
	Angled socket, M12x1, 5-pin	Cable, open end, 3-wire	2.5	541367	NEBU-M12W5-K-2.5-LE3
			5	541370	NEBU-M12W5-K-5-LE3